

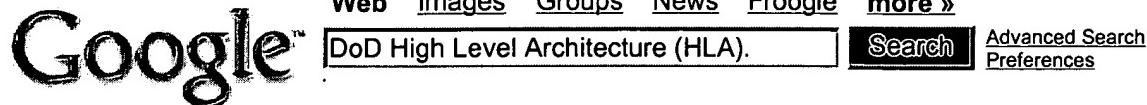
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L1	0	((distribut\$3 adj simulat\$4) or (parallel adj simulat\$4)) and (state adj variable) and (simulation adj time) and (state adj message)	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	ON	2004/11/10 21:07
L2	14	((distribut\$3 adj simulat\$4) or (parallel adj simulat\$4)) and (state adj variable) and (simulation adj time)	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	ON	2004/11/10 21:07
L3	12	I2 and message	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	ON	2004/11/10 21:09
L4	8	I2 and (state with message)	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	ON	2004/11/10 21:09
L5	10	I2 and @ad<"20000619"	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	ON	2004/11/10 21:08
L6	8	I5 and message	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	ON	2004/11/10 21:57
L7	5	I5 and (state with message)	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	ON	2004/11/10 21:09
L8	2	I6 and translat\$5	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	ON	2004/11/10 21:57

Results of L8

	Document ID	Issue Date	Title	Current OR	Current XRef
1	US 6324495 B1	20011127	Synchronous parallel system for emulation and discrete event simulation	703/17	703/13; 703/6; 713/375; 713/502; 719/315
2	US 6154735 A	20001128	Resource scheduler for scheduling railway train resources	706/45	706/16; 706/23; 706/41; 706/932
3	US 6134514 A	20001017	Large-scale network simulation method and apparatus	703/17	
4	US 5801938 A	19980901	Data processing method and apparatus for parallel discrete event simulation	700/2	713/375; 718/106
5	US 5794005 A	19980811	Synchronous parallel emulation and discrete event simulation system with self-contained simulation objects and active event objects	703/17	713/502; 719/315
6	US 5781762 A	19980714	Parallel proximity detection for computer simulations	703/21	700/90
7	US 5652871 A	19970729	Parallel proximity detection for computer simulation	703/6	700/90
8	US 5623413 A	19970422	Scheduling system and method	701/117	104/307; 246/2R; 701/20; 705/8

Results of LT

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1	US 6324495 B1	20011127	Synchronous parallel system for emulation and discrete event simulation	703/17	703/13; 703/6; 713/375; 713/502; 719/315
2	US 6154735 A	20001128	Resource scheduler for scheduling railway train resources	706/45	706/16; 706/23; 706/41; 706/932
3	US 5801938 A	19980901	Data processing method and apparatus for parallel discrete event simulation	700/2	713/375; 718/106
4	US 5794005 A	19980811	Synchronous parallel emulation and discrete event simulation system with self-contained simulation objects and active event objects	703/17	713/502; 719/315
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... The **High Level Architecture (HLA)** is a general purpose **architecture** for simulation ... different types of simulations developed and maintained by the **DoD** ...

<https://www.dmso.mil/public/transition/hla/> - 13k - Nov 9, 2004 - [Cached](#) - [Similar pages](#)

High Level Architecture

... the **High Level Architecture (HLA)** of the infrastructure in place to support their transition to this program. For those not familiar with this important **DoD** ...

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... **DoD HIGH LEVEL ARCHITECTURE BASELINE APPROVED**. The new **High Level Architecture (HLA)** has been designated the technical **architecture** for all simulations in the ...

www.dod.mil/releases/1996/b091896_bt537-96.html - 18k - [Cached](#) - [Similar pages](#)

The DoD high level architecture

... 10 September 1996. Memorandum, Subj: **DoD High Level Architecture (HLA)** for Simulations. <http://hla.dmso.mil/hla/policy/kaminski.doc> ...

portal.acm.org/citation.cfm?id=293308 - [Similar pages](#)

Advanced Distributed Simulation Technology II (ADST-II) High Level ...

... The project specifically involved the incorporation of the new **DoD High Level Architecture (HLA)** into the AC- I3O (omega) simulator and testbed of the Battle ...

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... Erlang and US Department of Defense (**DoD**) High Level Architecture (**HLA**). To: Subject: Erlang and US Department of Defense (**DoD**) High Level Architecture (**HLA**); ...

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[PDF] THE DoD HIGH LEVEL ARCHITECTURE: AN UPDATE

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... 10 September 1996. Memorandum, Subj: **DoD High Level Architecture (HLA)** for Simulations. <http://hla.dmso.mil/hla/policy/kaminski.doc> ...

gdangelo.web.cs.unibo.it/pool/didattica/tesi/paper/HLA/High_Level_Architecture_For_Simulation.pdf - [Similar pages](#)

Kaminski Memo: DoD HLA for Simulations

... DIRECTOR OF ADMINISTRATION AND MANAGEMENT, DIRECTORS OF THE DEFENSE AGENCIES.

SUBJECT: DoD High Level Architecture (HLA) for Simulations. ...

www.amso.army.mil/BCSEtopics/hla/memos/10sep96.htm - 19k - [Cached](#) - [Similar pages](#)

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Relevance scale **1 The cost of conservative synchronization in parallel discrete event simulations**

David M. Nicol

April 1993 **Journal of the ACM (JACM)**, Volume 40 Issue 2Full text available:  pdf(2.11 MB) Additional Information: full citation, abstract, references, citations, index terms, review

This paper analytically studies the performance of a synchronous conservative parallel discrete-event simulation protocol. The class of models considered simulates activity in a physical domain, and possesses a limited ability to predict future behavior. Using a stochastic model, it is shown that as the volume of simulation activity in the model increases relative to a fixed architecture, the complexity of the average per-event overhead due to synchronization, event list manipulation, looka ...

Keywords: conservative synchronization**2 Performance bounds on parallel self-initiating discrete-event simulations**

David M. Nicol

January 1991 **ACM Transactions on Modeling and Computer Simulation (TOMACS)**, Volume 1 Issue 1Full text available:  pdf(1.74 MB) Additional Information: full citation, abstract, references, citations, index terms, review

This paper considers the use of massively parallel architectures to execute discrete-event simulations of what we term "self-initiating" models. A logical process in a self-initiating model schedules its own state reevaluation times, independently of any other logical process, and sends its new state to other logical processes following the reevaluation. Our interest is in the effects of that communication on synchronization. Using a model that idealizes the communication topolo ...

Keywords: parallel simulation, synchronization protocol**3 Parallel simulation of a high speed LAN**

R. Rönnqvist, H. Rajaei, A. Popescu, M. Liljenstam, Y. Ismailov, R. Ayani

July 1994 **ACM SIGSIM Simulation Digest , Proceedings of the eighth workshop on Parallel and distributed simulation**, Volume 24 Issue 1

Full text available:  pdf(483.99 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Simulation of communication networks is often time consuming. Parallel simulation may be used to reduce the execution time of such a simulator. However, efficient modeling and simulation of such complex applications is not a trivial task. In this paper, we discuss the results of simulating a multigigabit/s network using both an optimistic and a conservative scheme. Our experimental result on a shared memory multiprocessor indicates that the conservative approach is superior to the optimisti ...

4 MIMD parallel simulation of circuit-switched communication networks

David Nicol, Albert Greenberg, Boris Lubachevsky

December 1992 **Proceedings of the 24th conference on Winter simulation**

Full text available:  pdf(758.99 KB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)



5 Optimistic simulation of parallel message-passing applications

Thomas Phan, Rajive Bagrodia

May 2001 **Proceedings of the fifteenth workshop on Parallel and distributed simulation**

Full text available:  pdf(719.72 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)
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Optimistic techniques can improve the performance of discrete-event simulations, but one area where optimistic simulators have been unable to show performance improvement is in the simulation of parallel programs. Unfortunately parallel program simulation using direct execution is difficult: the use of direct execution implies that the memory and computation requirements of the simulator are at least as large as that of the target application, which restricts the target systems and applica ...

6 Supercritical speedup

David Jefferson, Peter Reiher

April 1991 **Proceedings of the 24th annual symposium on Simulation**

Full text available:  pdf(983.59 KB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)



7 Parallel timing simulation on a distributed memory multiprocessor

Chih-Po Wen, Katherine A. Yelick

November 1993 **Proceedings of the 1993 IEEE/ACM international conference on Computer-aided design**

Full text available:  pdf(652.49 KB) Additional Information: [full citation](#), [references](#), [citations](#)



8 Parallel VHDL simulation

E. Naroska

February 1998 **Proceedings of the conference on Design, automation and test in Europe**

Full text available:  pdf(203.26 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)
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In this paper we evaluate parallel VHDL simulation based on conservative parallel discrete event simulation (conservative PDES) algorithms. We focus on a conservative simulation algorithm based on critical and external distances. This algorithm exploits the interconnection structure within the simulation model to increase parallelism. Further, a general method is introduced to automatically transform a VHDL model into a PDES model.

Additionally, we suggest a method to further optimize parallel s ...

Keywords: Conservative Parallel VHDL simulation, parallel discrete event simulation, PDES

9 Performance Experiments with the High Level Architecture and the Total Airport and Airspace Model (TAAM)

David J. Bodoh, Dr. Frederick Wieland

June 2003 **Proceedings of the seventeenth workshop on Parallel and distributed simulation**

Full text available:  pdf(238.16 KB)

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Additional Information: [full citation](#), [abstract](#), [index terms](#)

As it was originally envisioned and commonly used, the HLA is a mechanism for interconnecting disparate simulations over a network. Its main application has been distributed wargaming, where simulations prepared by different organizations are combined in a virtual environment for a specific training exercise or study objective. The individual simulations are called federates in the HLA world, while the collection of federates that interoperate in the virtual world is called a federation. The HLA specifie ...

10 An experimental distributed modeling system

Gary J. Nutt

April 1983 **ACM Transactions on Information Systems (TOIS)**, Volume 1 Issue 2

Full text available:  pdf(1.69 MB)

Additional Information: [full citation](#), [references](#), [index terms](#)

11 Consistency maintenance in multiresolution simulation

Paul F. Reynolds, Anand Natrajan, Sudhir Srinivasan

July 1997 **ACM Transactions on Modeling and Computer Simulation (TOMACS)**, Volume 7 Issue 3

Full text available:  pdf(302.67 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Simulations that run at multiple levels of resolution often encounter consistency problems because of insufficient correlation between the attributes at multiple levels of the same entity. Inconsistency may occur despite the existence of valid models at each resolution level. Cross-Resolution Modeling (CRM) attempts to build effective multiresolution simulations. The traditional approach to CRM—aggregation-disaggregation—causes chain disaggregation and puts an unacceptable burde ...

Keywords: consistency, methodologies, modeling maintenance, multiple resolution entity, multiresolution modeling, multiresolution simulation

12 Mobile Ad Hoc Networks: A cooperative cache architecture in support of caching multimedia objects in MANETs

W. H. O. Lau, M. Kumar, Svetha Venkatesh

September 2002 **Proceedings of the 5th ACM international workshop on Wireless mobile multimedia**

Full text available:  pdf(490.39 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper presents a cooperative caching architecture suitable for continuous media (CM) proxy caching in MANET environments. The proposed scheme introduces an **application manager** component, which is interposed between traditional Internet CM applications and the network layer. The application manager transparently performs data location and service

migration of active CM streaming sessions so as to exploit nearby data sources based on the dynamic topology of a MANET. We propose two data ...

Keywords: QoS, caching, continuous media streaming, mobile ad-hoc networks, service migration

13 Special issue on wireless pan & sensor networks: CAPTURE: location-free contact-assisted power-efficient query resolution for sensor networks



Ahmed Helmy

January 2004 **ACM SIGMOBILE Mobile Computing and Communications Review**, Volume 8

Issue 1

Full text available: [pdf\(844.09 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

Queries and small transfers are likely to constitute a significant portion of the flows in emerging classes of sensor networks. Route discovery for such queries incurs much more communication overhead than the actual data transfer. Especially for large-scale sensor networks, it is quite costly to establish shortest path routes for such types of requests. Flooding-based approaches for routing are designed to search for high quality routes. Such approaches may be suitable for prolonged transfers, ...

14 Path selection methods with multiple constraints in service-guaranteed WDM networks



Admela Jukan, Gerald Franzl

February 2004 **IEEE/ACM Transactions on Networking (TON)**, Volume 12 Issue 1

Full text available: [pdf\(691.03 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We propose a new approach to constraint-based path selection for dynamic routing and wavelength allocation in optical networks based on WDM. Our approach considers service-specific path quality attributes, such as physical layer impairments, reliability, policy, and traffic conditions, and uses a flooding-based transfer of path information messages from source to destination to find multiple feasible paths. It is fully decentralized, as it uses local network state information. To better understand ...

Keywords: constraint-based routing, electronic regeneration, end-to-end provisioning, quality of service (QoS), wavelength assignment (RWA), wavelength shifting

15 Comparative performance of circuit-switched networks based on blocking probability



C. Hein

August 1989 **Proceedings of the 1989 ACM/IEEE conference on Supercomputing**

Full text available: [pdf\(908.65 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

A class of dynamic parallel processor interconnection networks, called circuit-switched networks, are composed of layers of small crossbar elements. Although such networks provide full connectivity, they are often called blocking networks, since contentions for network links sometimes block message pathways. The results from a study are reported in which the goal was to determine the effect of variations in a network's topology to aid in the selection of more optimal architectures. Three approaches ...

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1 Advanced tutorials: Parallel simulation: parallel and distributed simulation systems

Richard M. Fujimoto

December 2001 Proceedings of the 33rd conference on Winter simulationFull text available: [pdf\(255.36 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

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3 Parallel discrete event simulation

Richard M. Fujimoto

October 1990 Communications of the ACM, Volume 33 Issue 10Full text available: [pdf\(7.32 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

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Jain J. Wang, Marc Abrams

December 1992 **Proceedings of the 24th conference on Winter simulation**

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Tobias Kiesling, Siegfried Pohl

May 2004 **Proceedings of the eighteenth workshop on Parallel and distributed simulation**

Full text available:  pdf(152.06 KB) Additional Information: [full citation](#), [abstract](#), [references](#)

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Full text available:  pdf(118.56 KB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

7 Cloning parallel simulations

Maria Hybinette, Richard M. Fujimoto

October 2001 **ACM Transactions on Modeling and Computer Simulation (TOMACS)**,

Volume 11 Issue 4

Full text available:  pdf(1.88 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

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Mary L. Bailey, Jack V. Briner, Roger D. Chamberlain

September 1994 **ACM Computing Surveys (CSUR)**, Volume 26 Issue 3

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Jain J. Wang, Marc Abrams

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November 1996 **Proceedings of the 28th conference on Winter simulation**

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14 Transparent incremental state saving in time warp parallel discrete event simulation

Robert Rönnqvist, Michael Liljenstam, Rassul Ayani, Johan Montagnat

July 1996 **ACM SIGSIM Simulation Digest , Proceedings of the tenth workshop on Parallel and distributed simulation**, Volume 26 Issue 1

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16 Nops: a conservative parallel simulation engine for TeD

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17 Emerging Methods: Space uncertain simulation events: some concepts and an application to optimistic synchronization

Francesco Quaglia, Roberto Beraldì

May 2004 **Proceedings of the eighteenth workshop on Parallel and distributed simulation**

Full text available:  [pdf\(169.55 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

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18 Simultaneous events and lookahead in simulation protocols

Vikas Jha, Rajive Bagrodia

July 2000 **ACM Transactions on Modeling and Computer Simulation (TOMACS)**, Volume 10 Issue 3

Full text available:  [pdf\(167.29 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

A discrete event simulation model may contain several events that have the same timestamp, referred to as simultaneous events. In general, the results of a simulation depend on the order in which simultaneous events are executed. Simulation languages and

protocols use different, sometimes ad hoc, tie-breaking mechanisms to order simultaneous events. As a result, it may be impossible to reproduce the results of a simulation model across different simulators. This article presents a systemat ...

Keywords: conditional event, conservative, lookahead, null message, optimistic, simulation protocols, simultaneous events, time ties, time warp

19 Parallel simulation using conservative time windows

Rassul Ayani, Hassan Rajaei

December 1992 **Proceedings of the 24th conference on Winter simulation**

Full text available:  pdf(821.39 KB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)



20 Miscellaneous II: Lookback: a new way of exploiting parallelism in discrete event simulation

Gilbert Chen, Boleslaw K. Szymanski

May 2002 **Proceedings of the sixteenth workshop on Parallel and distributed simulation**

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Lookback is defined as the ability of a logical process to change its past locally (without involving other logical processes). Logical processes with lookback are able to process out-of-timestamp order events, enabling new synchronization protocols for the parallel discrete event simulation. Two of such protocols, LB-GVT (LookBack-Global Virtual Time) and LB-EIT (LookBack-Earliest Input Time), are presented and their performance on the Closed Queuing Network (CQN) simulation is discussed. We al ...

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11 Fast-software-checkpointing in optimistic simulation: embedding state saving into the event routine instructions

Francesco Quaglia
May 1999 **Proceedings of the thirteenth workshop on Parallel and distributed simulation**

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In this paper we present a software approach, namely Fast-Software-Checkpointing (FSC), to reduce the running time of the state saving protocol in optimistic parallel discrete event simulation. The idea behind FSC is to use the instructions performed during the execution of an event as part of the state saving protocol, hence the total number of instructions due to state saving is reduced. Under FSC the time for saving the state of a logical process prior to the execution of an event e requires ...

12 Parallel and distributed simulation

Richard M. Fujimoto
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14 Parallel simulation of communicating finite state machines

Carl Tropper, Azzedine Boukerche

July 1993 **ACM SIGSIM Simulation Digest , Proceedings of the seventh workshop on Parallel and distributed simulation**, Volume 23 Issue 1

Full text available:  pdf(763.66 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We describe, in this paper, a synchronization/deadlock resolution mechanism for a network of communicating finite state machines implemented on a parallel machine. As it is message-based, it is appropriate for distributed memory machines. The technique was inspired by a project at the Jet Propulsion laboratories whose goal is the specification and verification of the software used to control the interplanetary spacecraft operated by the laboratory. The network of commu ...

15 An algorithm for parallel discrete event simulation using common memory

Bruce A. Cota, Robert G. Sargent

March 1989 **Proceedings of the 22nd annual symposium on Simulation**

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Most work on parallel discrete event simulation has been based on a distributed model of computation in which processes can only communicate through message passing. Here we study parallel discrete event simulation under a common memory model of computation. An algorithm for parallel discrete event simulation is developed based on the assumption that every process has direct access to the state of any other process. The objective is to avoid the high overhead associated with null messages a ...

16 Language support for parallel discrete-event simulations

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18 Automatic parallelization of discrete event simulation programs

Jya-Jang Tsai, Richard M. Fujimoto

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19 Parallel and distributed discrete event simulation: algorithms and applications

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20 Time-Parallel Trace-Driven Simulation of CSMA/CD

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[Abstract] [PDF Full-Text (323 KB)] IEEE CNF

2 Implementations of dispatch rules in parallel manufacturing simulation
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3 Comparative study of modern heuristic algorithms to service restoration in distribution systems

Toune, S.; Fudo, H.; Genji, T.; Fukuyama, Y.; Nakanishi, Y.;
Power Engineering Society Winter Meeting, 2002. IEEE , Volume: 2 , 27-31 Jan. 2002
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Quaglia, F.;
Parallel and Distributed Simulation, 1999. Proceedings. Thirteenth Workshop on, 1-4 May 1999
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Christoffersen, C.E.; Ozkar, M.; Steer, M.B.; Case, M.G.; Rodwell, M.;
Microwave Theory and Techniques, IEEE Transactions on, Volume: 47 , Issue 6 , June 1999

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3 A fuzzy-based distributed load balancing algorithm for large distributed systems

Chulhye Park; Kuhl, J.G.;
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5 , May 2004
Pages:1404 - 1413

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5 A sequential Monte Carlo filter for joint linear/nonlinear state estimation with application to DS-CDMA

Iltis, R.A.;

Signal Processing, IEEE Transactions on [see also Acoustics, Speech, and Signal Processing, IEEE Transactions on] , Volume: 51 , Issue: 2 , Feb. 2003
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